

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

AHRQ

March 2020 CDS Connect Work Group Call

CDS Connect

Agenda

Schedule	Topic
• 3:00 – 3:02	• Roll Call, Michelle Lenox (MITRE)
• 3:02 – 3:10	• Review of the Agenda, Maria Michaels (CDC) • Special Announcement
• 3:10 – 3:45	• Lessons Learned in CDS Usability: Mobilizing a Million Hearts (ONC LEAP) & Quantifying Efficiencies in Sharable CDS (AHRQ), Kristen Miller (MedStar Health)
• 3:45– 3:55	• What's New with CDS Connect This Month (MITRE)
• 3:55 – 4:00	• Open Discussion and Close Out, Maria Michaels (CDC) • Open discussion and announcements • Concluding comments, review next steps and adjourn

Special Announcement

- Coronavirus (COVID-19)
  - https://www.cdc.gov/coronavirus/2019-ncov/

LESSONS LEARNED IN CDS USABILITY:

Mobilizing a Million Hearts (ONC LEAP) & Quantifying Efficiencies in Shareable CDS (AHRQ)

Kristen Miller, DrPH, CPPS
Scientific Director, National Center for Human Factors in Healthcare, MedStar Health
Associate Professor of Emergency Medicine, Georgetown University School of Medicine
Affiliate Faculty, Innovation Center for Biomedical Informatics, Georgetown Medical Center

ONC LEAP: Project Aims

ONC Leap addresses well-documented and fast emerging challenges inhibiting the development, use, and/or advancement of well-designed interoperable health information technology. The purpose of the project is to:

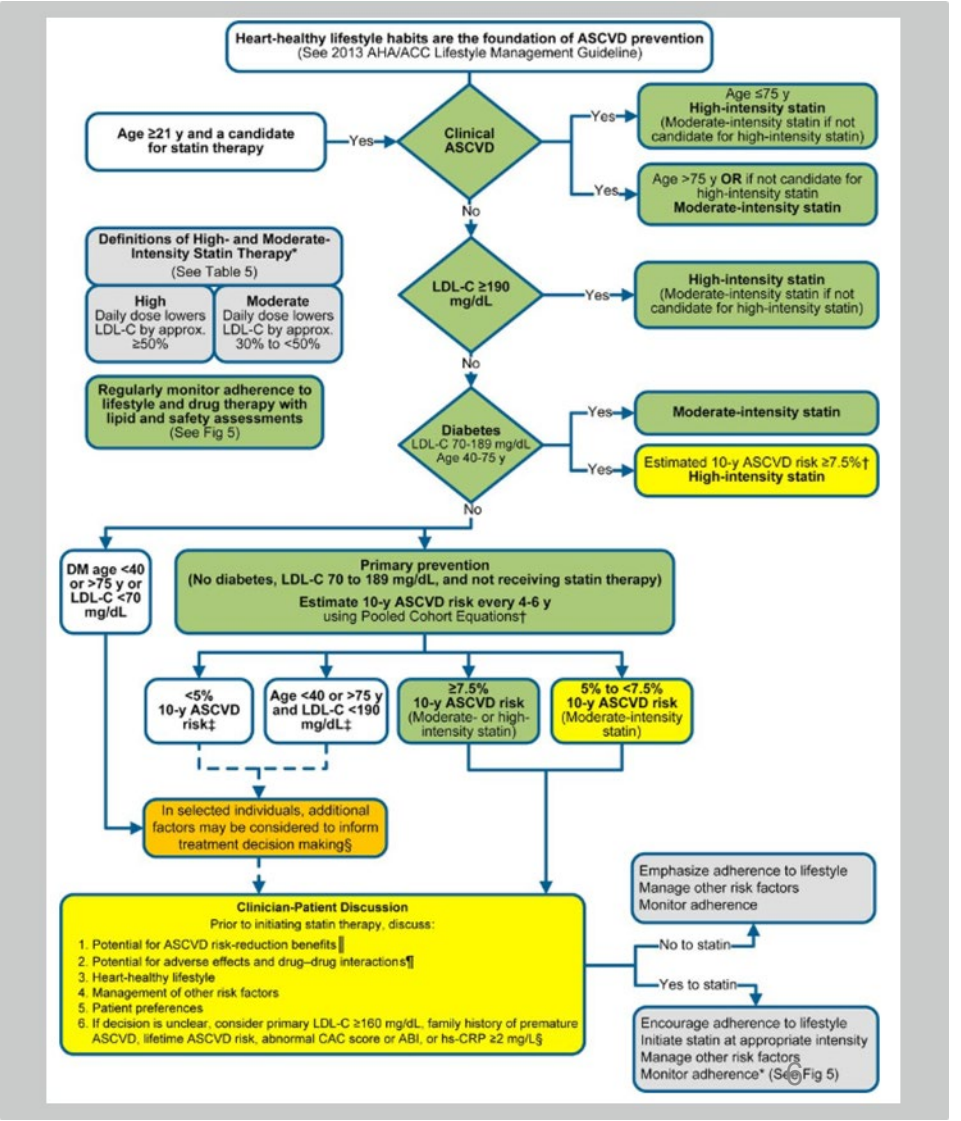
1. Support evidence-based clinical cognitive support that prompts management and preventative care.

2. Serve as proof-of-concept to transform risk calculators into active surveillance tools leading to guideline based workflow support through SMART on FHIR technology.

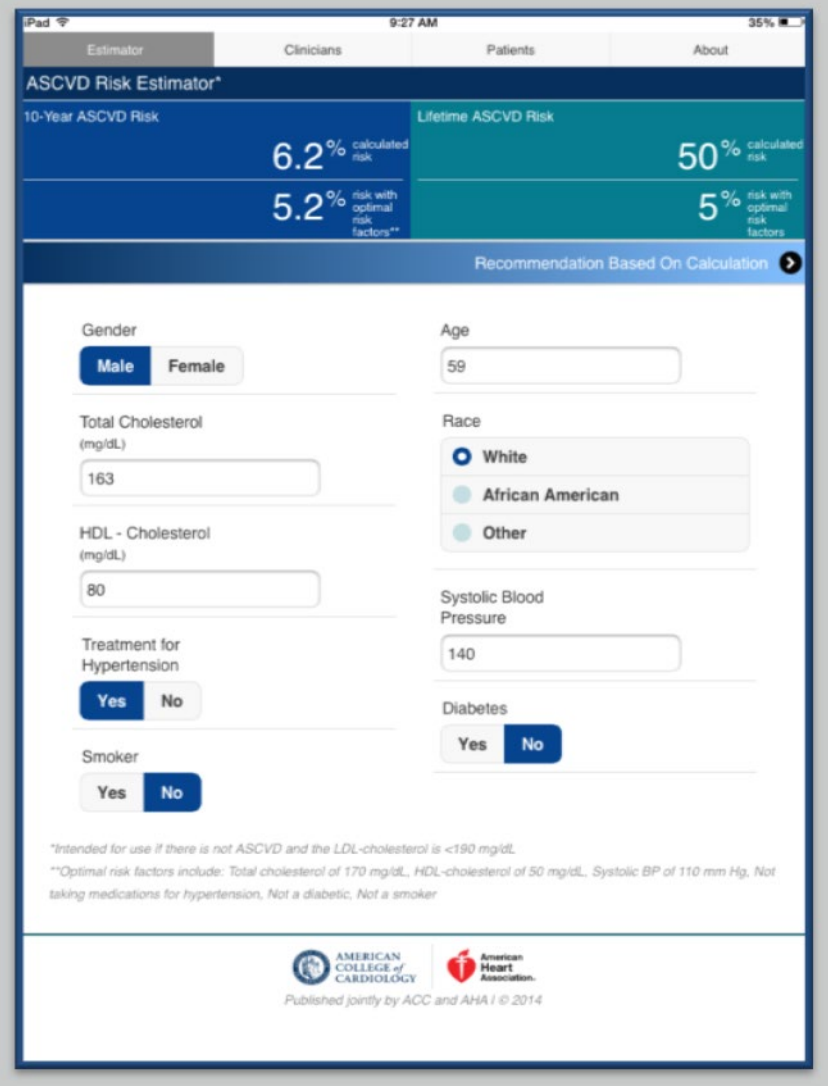
3. Leverage the technology to facilitate communication and coordination within providers, and between providers and patients as engaged members of their care with reduced clinical burden.

BACKGROUND: Million Hearts

- Cardiovascular disease remains the leading cause of death in the US.
- The American Heart Association and American College of Cardiology recommend use of the Atherosclerotic Cardiovascular Disease (ASCVD) risk estimator: evaluates 10-year and lifetime risk for ASCVD.
- Variables include: age, race, total and high-density lipoprotein (HDL) cholesterol levels, low level lipoprotein (LDL) cholesterol, systolic blood pressure, use of statin therapy, antihypertensive medication, use of aspirin therapy, smoking status, and diabetes status.
- Clinical decision support would be helpful for specialists (e.g., cardiologists) but also generalists (e.g., primary care, family medicine)



BACKGROUND: Million Hearts - continued



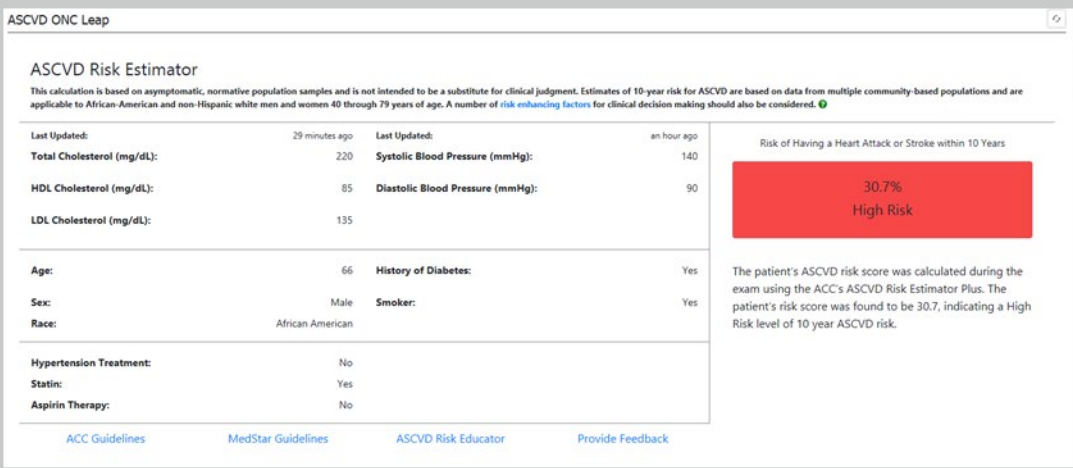
Our research addresses the following:

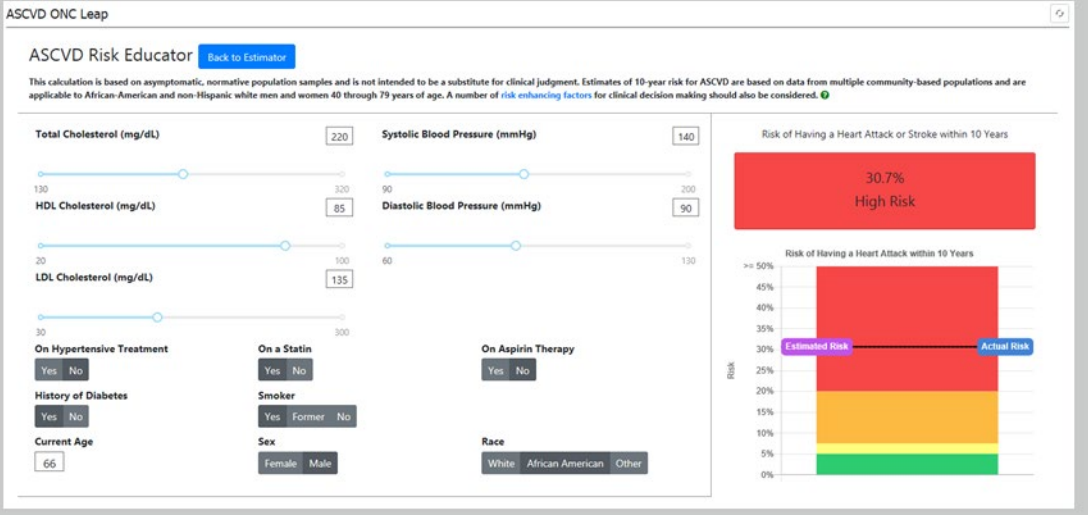
- Optimizing health IT tools that currently exist: removing the burden of active surveillance, pushing technology to bring relevant data to the clinician
- Reducing time required to integrate clinical guidelines at the point of care by leveraging different technological advancements in a single solution
- Developing solutions that are not product centric – our solution sits outside of the EHR and does not rely on the vendor to support modifications
- Developing solutions that are truly integrated into clinician and patient workflow
- Developing scalable solutions that change the way we think about patient data and decision support (multi-layered support and visualizations)

TECHNICAL SPECIFICATIONS (sample table: Features of Dynamic Risk Educator)

Function	Feature	Tech
Calculate & Recalculate scores	• Auto populate. ○ Auto populate risk score and patient values into dynamic risk calculator. ○ Option for MD to free type and edit value. ○ Option for MD to use a slider bar within validated ranges to change values. • Auto populate the Yes/No boxes for hypertension treatment, on a statin, etc. have ability when opened.	FHIR and CCL Call, MSH FHIR and UX
Display	• Clear indication that this dynamic calculator does NOT write to record. • Consider reference ranges tailored to individuals' demographic baseline and comorbidities. • Consider different graphic representations of risk besides bar.	*MPage with custom component FHIR
Date stamp	• Show time frame of when data was captured next to each lab value. • Hover over for specific date.	*FHIR
Patient Portal	• Explore integration potential.	
Educational Engagement	• Discharge summaries. • Links to education resources (diet, exercise, smoking cessation programs, etc.).	
Risk Level Indicators	• Explore risk bar to provide context and "best case" scenario.	App Programming

USABILITY TESTING (with clinicians)

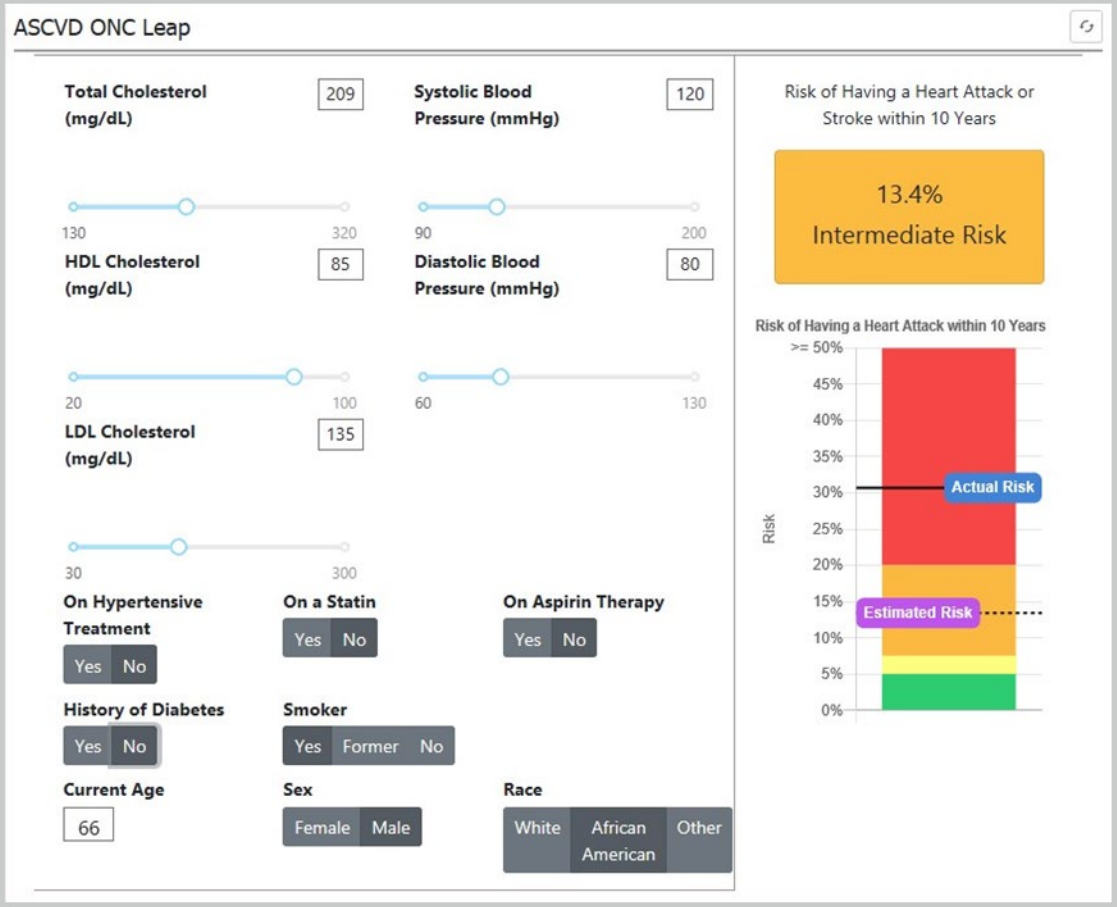




Usability Testing Methods:

- Stakeholder Interactions with Prototype and Interview
  - 8 Cardiologists
  - 7 Primary Care Physicians
  - Eye Tracking
- Data Analysis
  - Qualitative Coding
  - Video Analysis
- Synthesis
  - Revision of prototype functions and specifications

USER FEEDBACK (with patients)



User-Feedback Methods

- Stakeholder Interactions with Different Prototypes and Interview
  - 9 Patients
  - 3 Prototypes
- Interviews focused on patient understanding and engagement with their cardiovascular health
- Data Analysis
  - Qualitative Coding
- Synthesis
  - Revision of prototype functions and specifications

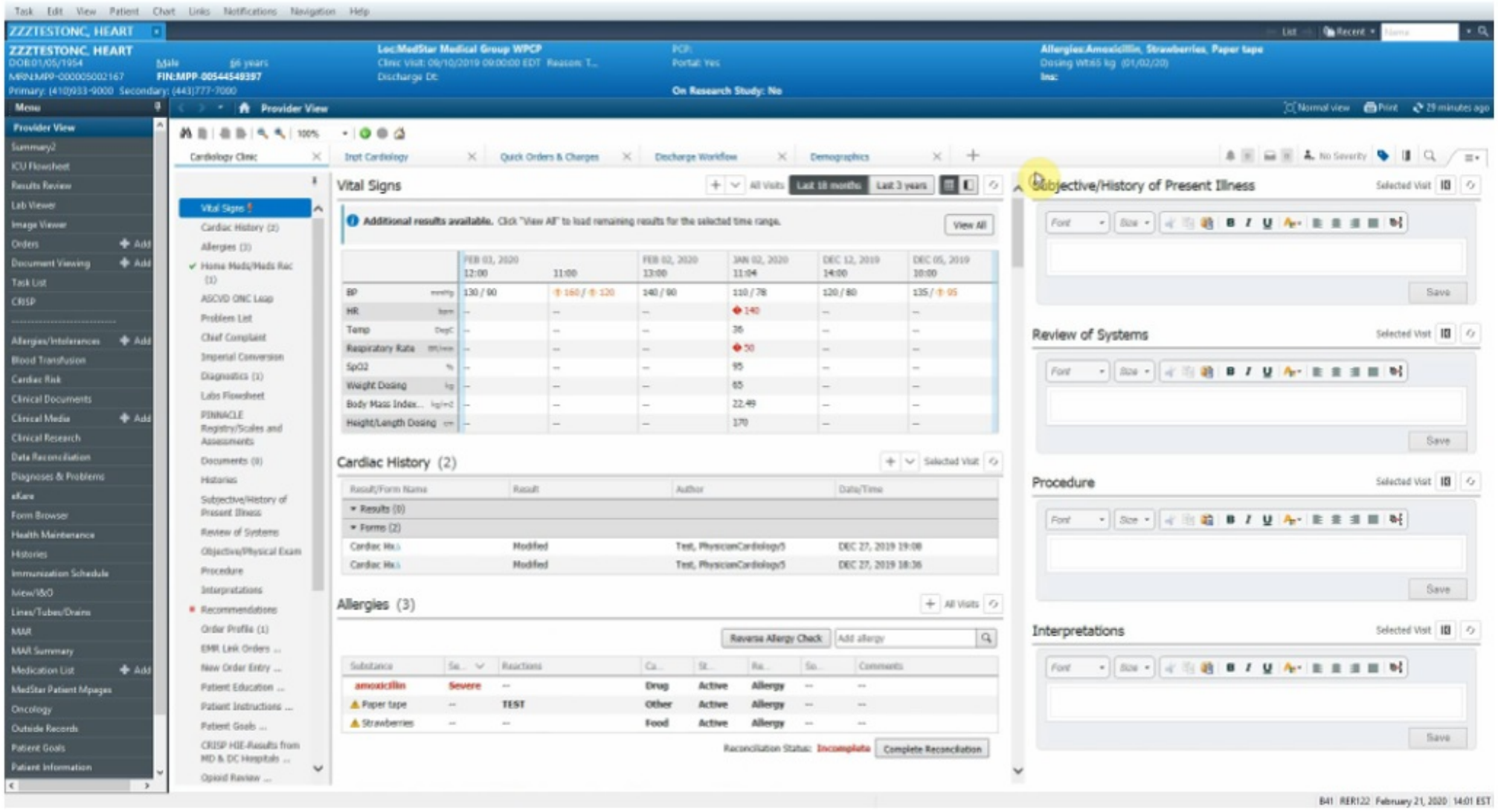
USER FEEDBACK (with patients) - continued

Participant Feedback

Strong preference for:

- Personalized displays that provide actional steps and guidance aligning with their care plan
  - Translating numeric risk into words (qualitative interpretation of output)
    - Access to tools outside of care visit

IMPLEMENTATION



KEY TAKEAWAYS: Challenges to Date

Strategic

- Optimizing inputs from multiple stakeholders and perspectives
- Validation costs and IT security challenges

Legal/ Ethical

- Personalizing population-level risk prediction
- Legal liability

Technical

- Applying SMART on FHIR and CDS Hooks solutions to systems that have not (yet) adopted
- Not all the desired data can easily and consistently be found in the FHIR resources (or may be documented in multiple places)
- SMART-on-FHIR apps behave differently within Cerner depending on the “profile”.

QUATIFYING EFFICIENCIES OF SHAREABLE CDS: Project Aims

1. To understand the role of shareable clinical decision support (CDS) resources in CDS development and implementation.
   a. To find what factors contribute to more efficient CDS development and implementation processes.
   b. To determine if shareable CDS resources lead to greater efficiency in developing and implementing CDS.

2. To gain this understanding by using shareable CDS resources available through AHRQ's CDS Connect.

UNDERSTANDING DEVELOPMENT

A multi-layered framework for disseminating knowledge for computer-based decision support

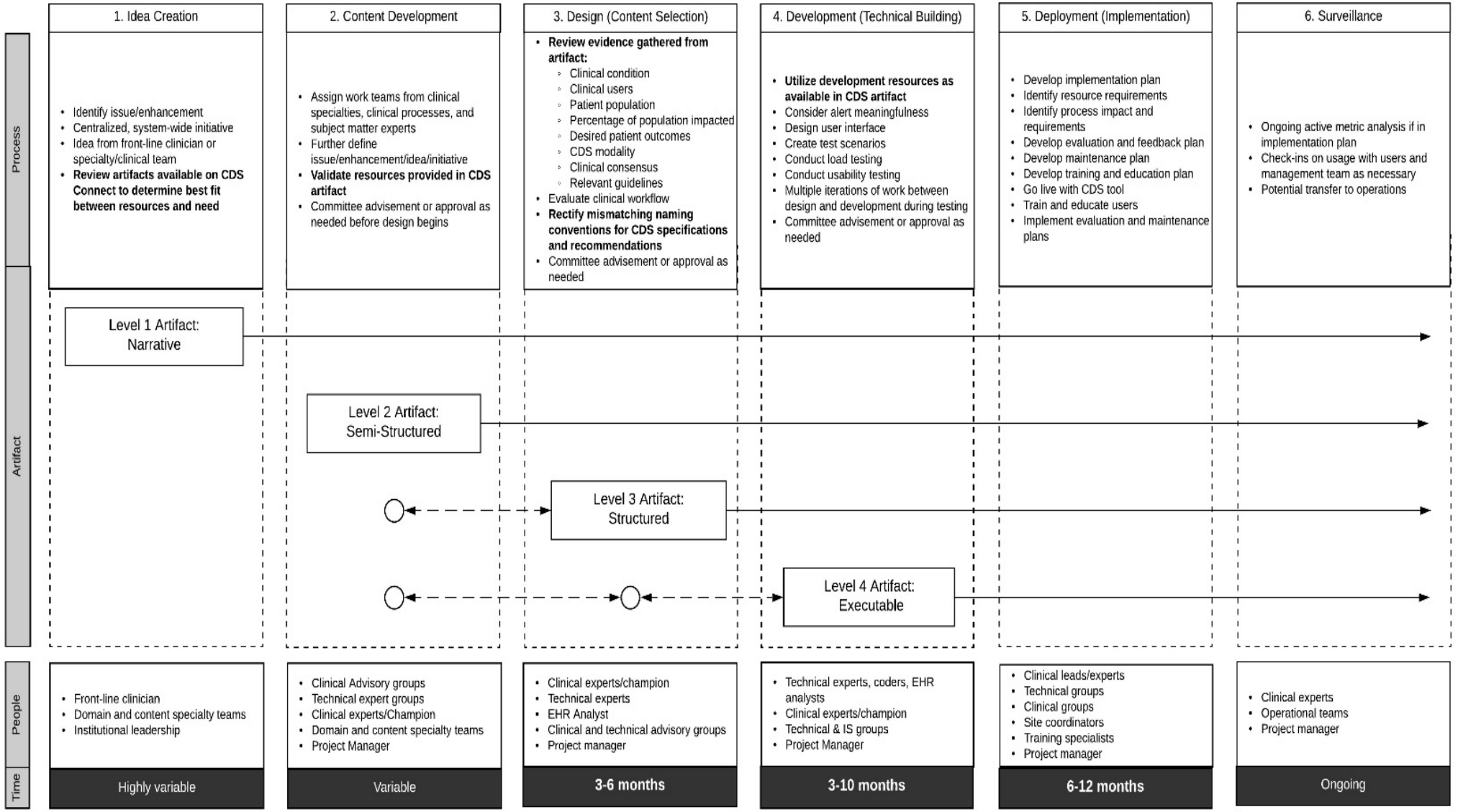
Aziz A Boxwala,[1] Beatriz H Rocha,[2,3] Saverio Maviglia,[2,3] Vipul Kashyap,[4] Seth Meltzer,[2] Jihoon Kim,[1] Ruslana Tsurikova,[2] Adam Wright,[2,3] Marilyn D Paterno,[2,3] Amanda Fairbanks,[2] Blackford Middleton[2,3]

Table 1 The four layers in the knowledge representation framework

	Narrative	Semi-structured	Structured	Executable
Format	Narrative text	Organized text	Coded and interpretable by computer	Coded and interpretable by CDS systems; variety of formats
Sharability of knowledge	Broad	Broad	Broad	Very limited
CDS modality and tool independent	Yes	Yes	Yes	No
Site independent	Yes	Yes	Yes	No
Author	Guideline developer	Clinical domain expert	Knowledge engineer	CDS implementer
Purpose	Communication of policy; synthesis of evidence	Recommendations for implementation in CDS	Precise communication; validation	Implementation for a particular site

CDS, clinical decision support.

PROCESS CHANGES IN SHAREABLE CDS



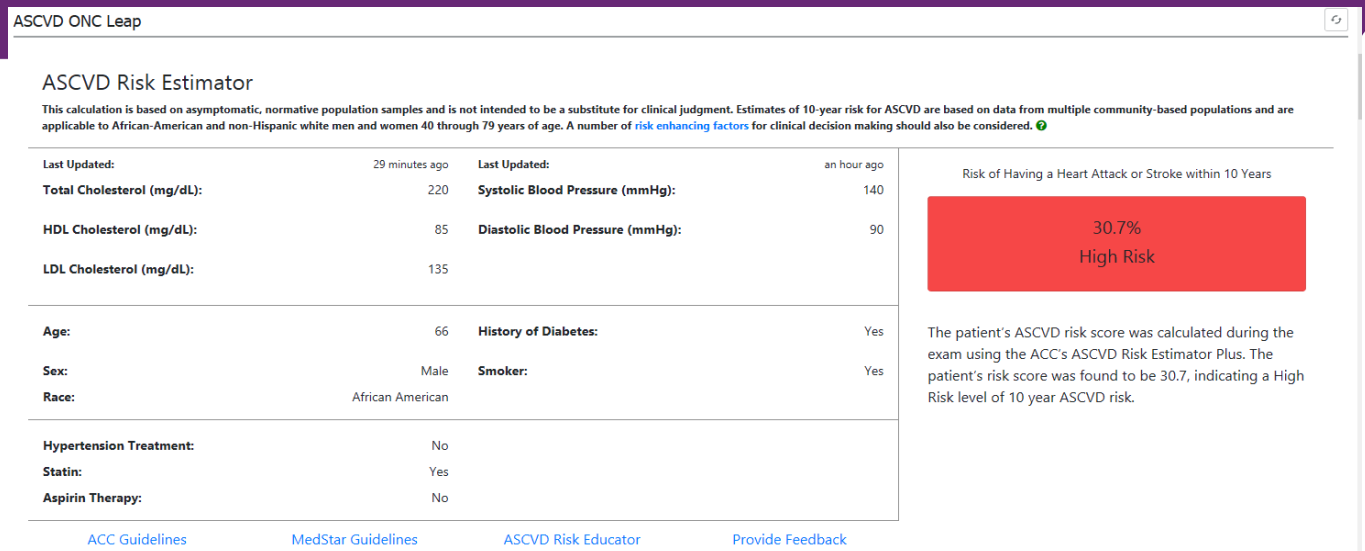
KEY TAKEAWAYS

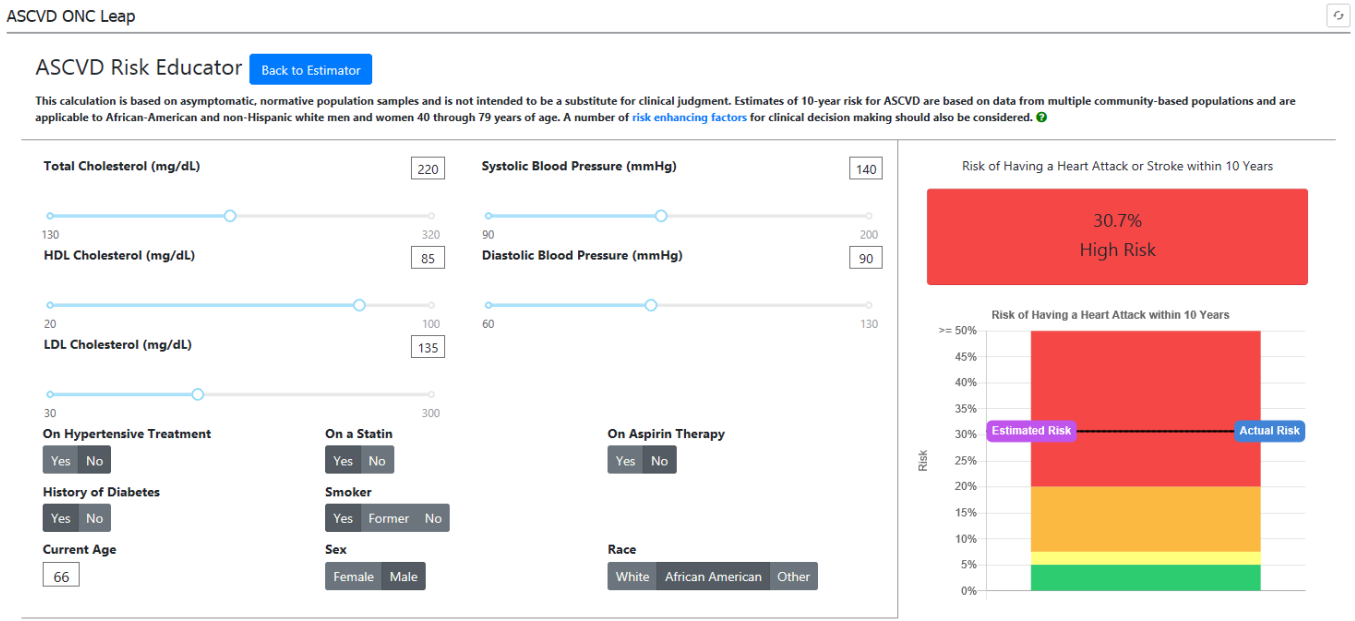
- CDS Connect improved some aspects of CDS design.
  - However, despite the presence of evidence-based guidelines in the artifacts, all sites still spent a considerable amount of time verifying the credibility and validity of the evidence.
- Using higher maturity artifacts from CDS Connect improved the CDS development stage.
  - However, it is difficult to translate efficiencies to the step of testing because institutions use rigorous policies to guide CDS testing. Most participants reported that testing duration may not be reduced by any resources provided in the CDS Connect artifacts.
- The deployment stage was not associated with any noticeable efficiencies.
- In general, mature, recently updated, comprehensive artifacts gave more measurable efficiencies.

Thank you!

Kristen Miller

kristen.e.miller@medstar.net





DISCUSSION:
LESSONS LEARNED IN CDS USABILITY:

Mobilizing a Million Hearts (ONC LEAP) & Quantifying Efficiencies in Shareable CDS (AHRQ)

WHAT'S NEW WITH CDS CONNECT

David Winters and Chris Moesel, MITRE

Updates and New Features

- Authoring Tool
  - Improved Accessibility (Section 508 Compliance)
  - Fixed ICD-10 URL in code selector
- Prototype Tools
  - CQL Testing Framework
    - Version 2.0.1: Updates to supported code systems
  - Pain Management Summary App
    - Versions 0.3.0/0.3.1: Updates to value sets and standardized codes, improved 508 compliance, bug fixes
- Repository
  - General text refresh on many key pages (e.g., "About")
- Artifacts
  - Statin Use for the Primary Prevention of CVD in Adults: Clinician-Facing CDS Intervention
    - Updated Implementation Guide and metadata
  - Factors to Consider in Managing Chronic Pain: A Pain Management Summary
    - Updated metadata, CQL downloads, and test patient downloads

Link to CDS Connect: https://cds.ahrq.gov/cdsconnect

ANNOUNCEMENTS, OPEN DISCUSSION AND CLOSE-OUT

Maria Michaels
Office of Public Health Scientific Services
Centers for Disease Control and Prevention